ABSTRACT

[00124] The invention relates to a resistance variable memory element including polarizable metal-chalcogen regions within a doped chalcogenide glass. A method for physically aligning the polarizable metal-chalcogen regions to form a conducting channel is provided. The invention also relates to a resistance variable memory element including metal-chalcogen regions within a chalcogenide glass backbone. The metal-chalcogen regions and glass regions bond to form a conducting channel. In addition, a method of operating such memory elements is provided in which metal ions move in and out of the conducting channels in response to applied voltages, thereby affecting the resistance of the memory elements.